

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



Steven L. Scott et al.

MULTISTREAM PROCESSING

MEMORY-AND

BARRIER-SYNCHRONIZATION

METHOD AND APPARATUS

Docket No.:

1376.733US1

Filed:

August 18, 2003

Examiner:

Unknown

Serial No.: 10/643,741

Due Date: N/A

Group Art Unit: 2153

MS Amendment

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

We are transmitting herewith the following attached items (as indicated with an "X"):

 \underline{X} A return postcard.

X An Information Disclosure Statement (2 pgs.), Form 1449 (4 pgs.), and copies of 47 cited documents.

If not provided for in a separate paper filed herewith, Please consider this a PETITION FOR EXTENSION OF TIME for sufficient number of months to enter these papers and please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.

Customer Number 21186

Atty: Thomas F. Brennan

Reg. No. 35,075

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SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.

(GENERAL)

PATENT

PHE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:

Steven L. Scott et al.

Examiner: Unknown

Serial No.:

10/643,741

Group Art Unit: 2153

Filed:

August 18, 2003

Docket: 1376.733US1

Title:

MULTISTREAM PROCESSING MEMORY-AND BARRIER-

SYNCHRONIZATION METHOD AND APPARATUS

COMMUNICATION CONCERNING RELATED APPLICATIONS

MS Amendment Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Applicants would like to bring to the Examiner's attention the following related applications in the above-identified patent application:

Serial/Patent No. 10/643742	Filing Date August 18, 2003	Attorney Docket 1376.697US1	Title DECOUPLED STORE ADDRESS AND DATA IN A MULTIPROCESSOR SYSTEM
10/643586	August 18, 2003	1376.699US1	DECOUPLED VECTOR ARCHITECTURE
10/643585	August 18, 2003	1376.700US1	LATENCY TOLERANT DISTRIBUTED SHARED MEMORY MULTIPROCESSOR COMPUTER
08/450251 5721921	May 25, 1995	499.580US1	BARRIER AND EUREKA SYNCHRONIZATION ARCHITECTURE FOR MULTIPROCESSORS
08/165265 5434995	December 10, 1993	200.466US1	BARRIER SYNCHRONIZATION FOR DISTRIBUTED MEMORY MASSIVELY PARALLEL PROCESSING SYSTEMS
08/615671 5835925	March 13, 1996	200.581US1	USING EXTERNAL REGISTERS TO EXTEND MEMORY REFERENCE CAPABILITIES OF A MICROPROCESSOR

COMMUNICATION CONCERNING RELATED APPLICATIONS

Serial Number: 10/643,741

Filing Date: August 18, 2003

Title: MULTISTREAM PROCESSING MEMORY-AND BARRIER-SYNCHRONIZATION METHOD AND APPARATUS

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August 18,

2003

1376.724US1

RELAXED MEMORY CONSISTENCY

MODEL

10/643758

August 18, 2003

1376.729US1

REMOTE TRANSLATION

MECHANISM FOR A MULTINODE

SYSTEM

Respectfully submitted,

STEVEN L. SCOTT ET AL.

By Applicants' Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.

P.O. Box 2938

Minneapolis, MN 55402

(612) 373-6909

Date October 12, 2004

Thomas F. Brennan

Reg. No. 35,075

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Signature

S/N 10/643,741



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:

Steven L. Scott et al.

Examiner:

Unknown

Serial No.:

10/643,741

Group Art Unit:
Docket:

2153 1376.733US1

Filed: Title: August 18, 2003 Docket: 137
MULTISTREAM PROCESSING MEMORY-AND BARRIER-

SYNCHRONIZATION METHOD AND APPARATUS

INFORMATION DISCLOSURE STATEMENT

MS Amendment Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 et. seq., the enclosed materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicants respectfully request that this Information Disclosure Statement be entered and the documents listed on the attached Form 1449 be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicants request that a copy of the 1449 form, initialed as being considered by the Examiner, be returned to the Applicants with the next official communication.

Pursuant to 37 C.F.R. §1.97(b), it is believed that no fee or statement is required with the Information Disclosure Statement. However, if an Office Action on the merits has been mailed, the Commissioner is hereby authorized to charge the required fees to Deposit Account No. 19-0743 in order to have this Information Disclosure Statement considered.

Filing Date: August 18, 2003

Title: MULTISTREAM PROCESSING MEMORY-AND BARRIER-SYNCHRONIZATION METHOD AND APPARATUS

The present application is a U.S. national patent application filed after June 30, 2003. Thus, Applicant believes that the U.S. Patent & Trademark Office has waived the requirement under 37 C.F.R. 1.98 (a)(2)(i) for submitting a copy of each cited U.S. patent and each U.S. patent application publication. The waiver is provided in a pre-OG notice from the U.S. Patent & Trademark Office entitled "Information Disclosure Statements May Be Filed Without Copies of U.S. Patents and Published Applications in Patent Applications filed after June 30, 2003" and dated July 11, 2003. Applicant acknowledges the requirement to submit copies of foreign patent documents and non-patent literature in accordance with 37 C.F.R. 1.98(a)(2).

The Examiner is invited to contact the Applicants' Representative at the below-listed Telephone number if there are any questions regarding this communication.

Respectfully submitted,

STEVEN L. SCOTT ET AL.

By their Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A. P.O. Box 2938
Minneapolis, MN 55402
(612) 373-6909

Date () at. 12, 2004

Thomas F. Brennan Reg. No. 35,075

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Substitute for form 1449A/PTO INFORMATION DISCLOSURE Complete if Known 10/643,741 **Application Number** STATEMENT BY APPLICANT (Use as mage) prehi as needs sary) August 18, 2003 Filing Date Scott, Steven **First Named Inventor** 2153 **Group Art Unit** Unknown **Examiner Name** Attorney Docket No: 1376.733US1

		US PA	ATENT DOCUMENT	S		
Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	Filing Date If Appropriate
	US-4,771,391	09/13/1988	Blasbalg, Herman	364	514	07/21/1986
	US-4,868,818	09/19/1989	Madan, Herb S., et al.	371	11	10/29/1987
	US-4,933,933	06/12/1990	Dally, William J., et al.	370	60	12/19/1986
	US-5,008,882	04/16/1991	Peterson, , et al.	370	943	08/17/1987
	US-5,031,211	07/09/1991	Nagai, Yasuhiro , et al.	379	221	02/01/1990
	US-5,036,459	07/30/1991	Den Haan, Petrus A., et al.	364	200	03/09/1989
1	US-5,105,424	04/14/1992	Flaig, Charles M., et al.	370	941	06/02/1988
	US-5,157,692	10/20/1992	Horie, Takeshi, et al.	375	38	03/20/1990
	US-5,161,156	11/03/1992	Baum, Richard I., et al.	371	7	02/02/1990
	US-5,170,482	12/08/1992	Shu, Renben, et al.	395	800	02/13/1991
	US-5,175,733	12/29/1992	Nugent, Steven F.	370	94	12/27/1990
	US-5,218,601	06/08/1993	Chujo, Takafumi , et al.	370	16	12/20/1990
	US-5,218,676	06/08/1993	Ben-ayed, Mondher, et al.	395	200	01/08/1990
	US-5,239,545	08/24/1993	Buchholz, Dale R.	370	95.3	11/05/1990
	US-5,276,899	01/04/1994	Neches, Philip M.	395	`800	08/10/1990
	US-5,280,474	01/18/1994	Nickolls, John R., et al.	370	60	01/05/1990
	US-5,313,628	05/17/1994	Mendelsohn, Noah R., et al.	395	575	12/30/1991
•	US-5,313,645	05/17/1994	Rolfe, David B.	395	800	05/13/1991
	US-5,331,631	07/19/1994	Teraslinna, Kari T.	370	60	03/16/1993
	US-5,333,279	07/26/1994	Dunning, Dave	395	325	06/01/1992
	US-5,341,504	08/23/1994	Mori, Kinji , et al.	395	800	03/01/1990
	US-5,347,450	09/13/1994	Nugent, Steven F.	395	200	08/19/1993
	US-5,353,283	10/04/1994	Tsuchiya, Paul F.	370	60	05/28/1993
	US-5,365,228	11/15/1994	Childs, Philip L., et al.	340	825.8	08/21/1991
	US-5,434,995	07/18/1995	Oberlin, Steven M., et al.	395	550	12/10/1993
* · · · · · · · · · · · · · · · · · · ·	US-5,440,547	08/08/1995	Easki, Hiroshi, et al.	370	60	01/05/1994
	US-5,517,497	05/14/1996	LeBoudec, Jean- Yves, et al.	370	60.1	03/21/1995
	US-5,546,549	08/13/1996	Barrett, Linda, et al.	395	309	06/01/1994

EXAMINER

Sheet 1 of 4

DATE CONSIDERED

PTO/SB/08A(10-01)
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Substitute for form 1449A/PTO	Complete if Known			
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application Number	10/643,741		
(Use as many sheets as necessary)	Filing Date	August 18, 2003		
	First Named Inventor	Scott, Steven		
	Group Art Unit	2153		
	Examiner Name Unknown			
Sheet 2 of 4	Attorney Docket No: 1	376.733US1		

US-5,548,639	08/20/1996	Ogura, Takao , et al.	379	221	10/22/1992
US-5,550,589	08/27/1996	Shiojiri, Hiroshisa , et al.	348	387	11/04/1994
US-5,555,542	09/10/1996	Ogura, Takao , et al.	370	94.1	01/11/1996
US-RE28,577	10/21/1975	Schmidt, William G.	179	15 BA	11/21/1973

=	E	FOREIGN PATEN	Name of Patentee or Applicant of	T		- 2
Examiner Initials*	Foreign Document No	Publication Date	cited Document	Class	Subclass	T ²
	EP-0353819A2	02/07/1990	Gupta, Rajiv , et al.	G06F	9/46	
	EP-0473452A2	03/04/1992	Duerrschmid, O., et al.	G06F	9/46	<u></u>
	EP-0475282A2	03/18/1992	Kametani, Masatusugu	G06F	9/46	L
	EP-0501524A2	09/02/1992	Hillis, Daniel W., et al.	G06F	15/16	<u></u>
	EP-0570729A2	11/24/1993	Collins, Clive A., et al.	G06F	15/16	
	WO-87/01750A1	03/26/1987	Anderson, S.	E04B	1/94	L
	WO-88/08652A1	11/03/1988	Hillis, D. W., et al.	H04J	3/26	
	WO-95/16236A1	06/15/1995	Oberlin, Steven M., et al.	G06F	9/46	
· · · · · · · ·	WO-96/10283A1	04/04/1996	Bonner, J.	H02 H	3/087	
	WO-96/32681A1	10/17/1996	Thorson, Gregory M., et al.	G06F	15/16	

	OTHER	R DOCUMENTS NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
		"Deadlock-Free Routing Schemes on Multistage Interconnection Networks", IBM Technical Disclosure Bulletin, 35, (December, 1992),232-233	
		ADVE, V. S., et al., "Performance Analysis of Mesh Interconnection Networks with Deterministic Routing", <u>Transactions on Parallel and Distributed Systems</u> , (March 1994),225-246	
		BOLDING, KEVIN, "Non-Uniformities Introduced by Virtual Channel Deadlock Prevention", <u>Technical Report 92-07-07</u> , <u>Department of Computer Science and Engineering</u> , <u>FR-35 University of Washington</u> ; <u>Seattle</u> , <u>WA 98195</u> , (July 21, 1992),	
		BOLLA, F R., "A Neural Strategy for Optimal Multiplexing of Circuit and Packet-Switched Traffic", <u>Department of Communications</u> , <u>Computer and Systems</u> Science (DIST), University of Genova, 1324-1330	
		BOURA, Y M., et al., "Efficient Fully Adaptive Wormhole Routing in n-dimenstional Meshes", IEEE, (1994),589-596	
		BUNDY, A., et al., "Turning Eureka Stepsinto Calculations in Automatic Program", UK IT, (IEE Conf. Pub. 316), (1991),221-226	
		CARLILE, BRADLEY R., "Algorithms and Design: The CRAP APP Shared-Memory System", COMPCON SPRING '93, San Francisco, CA, (February 22, 1993),312-320	

EXAMINER DATE CONSIDERED

	Under the Paperwork Reduction Act of 1995, no persons are	PTO/SB08A(10.01) Approved for use through 10/31/2002, OMB 651-0031 US Patent & Trademark Office, U.S. DEPARTMENT OF COMMERCE required to respond to a collection of information unless it contains a valid OMB control number.
Substitute for form 1449A/PTO INFORMATION DISCLOSURE	Complete if Known	
STATEMENT BY APPLICANT (Use as many sheets as necessary)	Application Number	10/643,741
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	First Named Inventor	Scott, Steven
	Group Art Unit	2153
	Examiner Name	Unknown
Sheet 3 of 4	Attorney Docket No: 1	1376.733US1

	OTHER	R DOCUMENTS NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
		CHIEN, A. A., et al., "Planar-Adaptive Routing: Low-Cost Adaptive Networks for	
		Multiprocessors", Pro. 19th International. Symposium on Computer Architecture,	
		(May 1992),268-277	
		DALLY, W. J., et al., "Deadlock-Free Adaptive Routing in Multicomputer	
		Networks Using Virtual Channels", I.E.E.E. Transactions on Parallel and	
		<u>Distributed Systems, 4(4), (April 1993),466-475</u>	ļ
		DALLY, WILLIAM, et al., "Deadlock-Free Message Routing in Multiprocessor	
		Interconnection Networks", IEEE Transactions on Computers, C-36, (May	
		1987),547-553	ļ
		DALLY, WILLIAM, "Performance Analysis of k-ary n-cube Interconnection	
		Networks", IEEE Transactions on Computers, 39(6), (June 1990),775-785	
		DALLY, W. J., "Virtual Channel Flow Control", Pro. 17th International	
		Symposium on Computer Architecture, pp. 60-68, May 1990,	
		DUATO, J., "A New Theory of Deadlock-Free Adaptive Routing in Wormhole	
		Networks", I.E.E.E. Transactions on Parallel and Distributed Systems, 4(12),	
		(Dec 1993),1320-1331	
		FAANES, G. J., et al., "DECOUPLED VECTOR ARCHITECTURE", US Patent	
	ļ	Application Ser. No. 10/643,586, filed August 18, 2003 (1376.699US1), 47	
		Pages	
		GALLAGER, ROBERT, "Scale Factors for Distributed Routing Algorithm", NTC	
	<u> </u>	77 Conference Record, 2, at 2-1 through 2-5,	-
		GHARACHORLOO, KOUROSH, "Two Techniques to Enhance the	
		Performance of Memory Consistency Models", (1991),	
		GLASS, C. J., et al., "The Turn Model for Adaptive Routing", Pro. 19th	
		International Symposium on Computer architecture, (May 1992),278-287	
		GRAVANO, L, et al., "Adaptive Deadlock- and Livelock-Free Routing with all	
		Minimal Paths in Torus Networks", <u>IEEE Transactions on Parallel and Distributed</u>	
		Systems, 5(12), (December 1994),1233-1251	
		GUPTA, RAJIV, et al., "High speed Synchronization of Processors Using Fuzzy	
		Barriers", International Journakl of Parallel Programming 19 (1990) February,	
		No. 1, New York, US pp 53-73,	
		ISHIHATA, HIROAKI, et al., "Architecture of Highly Parallel AP1000 Computer",	
		Scripta Technica, Inc., Systems and Computers in Japan 24, No. 7,,(1993),pp.	
		69-76	
		JESSHOPE, C. R., et al., "High Performance Communications in Processor	
		Networks", Proc. 16th International Symposium on Computer Architecture, (May	
		1989),pgs. 150-157	-
		KIRKPATRICK, S., et al., "Optimization by Simulated Annealing", SCIENCE,	
		May 13, 1993, 220(4599), (May 1983),671-680	
	L		<u></u>

DATE CONSIDERED **EXAMINER**

PTO/SB/08A(10-01)
Approved for use through 10/31/2002, OMB 851-0031
US Palent & Trademark Office: U.S. DEPARTMENT OF COMMERCE
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	Group Art Unit	2153			
	Examiner Name	Unknown			
Sheet 4 of 4	Attorney Docket No: 1	1376.733US1			

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Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
	-	LINDER, DANIEL H., et al., "AN ADAPTIVE AND FAULT TOLERANT	
		WORMHOLE ROUTING STRATEGY FOR K-ARY N-CUBES", <u>IEEE</u>	
		TRANSACTIONS ON COMPUTERS,40(1), (1991),pgs. 2-12	
		LUI, Z, et al., "Grouping Virtual Channels for Deadlock-Free Adaptive Wormhole	
		Routing", PARLE '93 Parallel Parallel Architectures and Languages Europe, 5th	
		International PARLE Conference, Munich, Germanyl, (June 14-17, 1993),254-	
		265	ļ
		NUTH, PETER, et al., "The J-Machine Network", IEEE, (1992),pgs. 420-423	
		O'KEEFE, MATTHEW T., et al., "Static Barrier MIMD: Architecture and	
		Performance Analysis", Journal of Parallel and Distributed Computing No. 2.,	İ
		(March 25, 1995),pp. 126-132	
		SCOTT, S. L., "DECOUPLED STORE ADDRESS AND DATA IN A	
		MULTIPROCESSOR SYSTEM", US Patent Application Ser. 10/643,742, filed	
		<u>August 18, 2003 (1376.697US1),</u> 27 Pages	ļ
İ		SCOTT, S. L., "LATENCY TOLERANT DISTRIBUTED SHARED MEMORY	
		MULTIPROCESSOR COMPUTER", <u>US Patent Application Ser. No. 10/643,585</u> ,	
		filed August 18, 2003 (1376.700US1), 17 Pages	ļ
		SCOTT, S. L., et al., "RELAXED MEMORY CONSISTENCY MODEL", <u>US</u>	
		Patent Application Ser. No. 10/643,754, filed August 18, 2003 (1376.724US1),	
		144 Pages	-
		SHEETS, K., et al., "REMOTE-TRANSLATION MECHANISM FOR A	
		MULTINODE SYSTEM", US Patent Application Ser. No. 10/643758, filed August	
		18, 2003 (1376.729US1), 42 Pages	
		SHUMAY, M, "Deadlock-Free Packet Networks", <u>Transputer Research and</u>	
		Applications 2, NATUG-2 Proceedings of the Second Conference of the North	ŀ
		American Transputer Users Group, (October 18-19, 1989),140-177	
		SNYDER, L., "Introduction to the Configurable, Highly Parallel Computer",	
		IEEE, (January 1982),pp. 4756 TALIA, D., "Message-Routing Systems for Transputer-Based Multicomputer",	
		IEEE Micro, Vol. 13, No. 3, XP000380340, (June 1993),62-72	
		WANG, WEILIN, et al., "Trunk Congestion Control in Heterogeneous Circuit	1
		Switched Networks", IEEE, (July 1992),pgs. 1156-1161	
		WU, MIN-YOU, et al., "DO and FORALL: Temporal and Spacial Control	ļ .
		Structures", Procedings, Third Workshop on Compilers for Parallel Computers,	
		ACPC/TR, July 1992,	
		YANG, C. S., et al., "Performance Evaluation of Multicast Wormhole Routing in	
		2D-Torus Multicomputers", <u>IEEE</u> , (1992),173-178	
	-	YANTCHEV, J., et al., "Adoptive, low latency, deadlock-free packet routing for	
		networks of processors\", IEEE Proceedings, 136, (May 1989),pp. 178-186	
		Thereating of processors (included initial too, (way 1000),pp. 170-100	L

EXAMINER DATE CONSIDERED